

II. REMARKS

A. Claim Objections

In the Office Action, claims 16 and 18 were objected to because of informalities. These claims have been amended as suggested in the Office Action.

B. Claim Rejections

In the Office Action, claims 2-16, 18 and 20 were allowed. Claim 19 was rejected as being anticipated by published U.S. patent application Pub. No. 2004/0223575 to Meltzer. Applicant traverses the rejection for the following reasons.

1. Claim 19 As Amended Is Not Anticipated By Meltzer

Claim 19 has been amended to clarify that “the current provided to the timing capacitor of the loop filter is provided from an integrator circuit responsive to an output signal from an auxiliary digital frequency detector whose output signal is related to a phase difference between an output signal of a programmable divider and a reference signal supplied to the auxiliary digital frequency detector.” Claim 19 as amended further clarifies that “the programmable divider is responsive to an output signal of the frequency synthesizer.”

The Meltzer reference does not disclose or suggest all of the elements of amended claim 19. Meltzer discloses a frequency synthesizer having two loops: an analog loop and a digital loop. In Meltzer, however, the digital frequency difference detector 15 is not coupled to the loop filter of the phase locked loop, which is in the analog loop of Meltzer’s design. Rather, the digital frequency difference detector 15 is coupled to the VCO 11 in Meltzer for the purpose of controlling the center frequency of the VCO. See Meltzer, Figure 1 and paragraph [0014].

This is fundamentally different from the method claimed in amended claim 19. Although it has been known for some time that analog mixers can be used as phase detectors, they are not

widely used in PLL circuits because of their inability to acquire phase lock. In the method of claim 2, the auxiliary digital frequency detector detects the phase difference between the feedback signal from the programmable divider and the reference signal. When out of lock, a “steering current” is caused to flow, via the integrator circuit, into or out of the loop filter of the PLL. This in turn causes the voltage applied to the VCO by the loop filter to ramp up or down at a rate set by a time constant of the loop filter. When the VCO reaches a frequency such that the output signal from the analog phase mixer detector is within the bandpass range of the loop filter, phase lock for the PLL is achieved. Thus, the auxiliary digital phase detector, by being coupled to an input terminal of the loop filter to provide the steering current to the loop filter when the PLL is out of lock, allows an analog phase mixer detector to be used in the PLL. This is an important potential benefit because frequency detectors implemented as analog mixers can provide excellent phase noise performance.

Therefore, claim 19 not anticipated by or obvious in view of Meltzer and are in condition for allowance.

2. Meltzer Is Not Prior Art

The Office Action states that Meltzer is prior art under 35 U.S.C. § 102(b). Meltzer, however, was published after the present application was filed. The Meltzer application was published in November 2004, whereas the present application was filed in November 2003. Therefore, Meltzer does not qualify as prior art under 35 U.S.C. § 102(b).

In addition, although Meltzer claims priority to a provisional application filed April 1, 2003, Meltzer does not even qualify as prior art under 35 U.S.C. § 102(e) because the invention of claim 19 was conceived prior to April 2003. In support, enclosed is a declaration from the inventor of the present application, Mr. A. David Williams. Mr. Williams’s declaration states

that he conceived of the subject matter of claim 19 prior to April 1, 2003. As proof thereof, attached is a page from Mr. Williams's laboratory notebook showing the inventive circuit, which performs the method of claim 19, including providing a "steering current" to the loop filter. The date of the page has been redacted, but Mr. Williams's declaration avers that it is dated prior to April 1, 2003. Mr. Williams's declaration also states that Mr. Williams exercised due diligence from prior to April 1, 2003 to reduce the invention to practice.


Therefore, Meltzer is not prior art. As such, amended claim 19 is not anticipated by Meltzer.

III. CONCLUSION

In view of the above, Applicant respectfully requests withdrawal of the rejections and allowance of the claims. If the Examiner is of the opinion that the instant application is in condition for disposition other than allowance, the Examiner is respectfully requested to the undersigned attorney at the telephone number listed below in order that the Examiner's concerns may be expeditiously addressed.

Respectfully submitted,

Date: October 14, 2005


Mark G. Knedeisen
Reg. No. 42,747

KIRKPATRICK & LOCKHART NICHOLSON GRAHAM LLP
Henry W. Oliver Building
535 Smithfield Street
Pittsburgh, Pennsylvania 15222

Ph. (412) 355-6342
Fax (412) 355-6501